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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/021,460	10/29/2001	Thomas Furhrer	10191/2036	2179
26646	7590	10/05/2004	EXAMINER	
KENYON & KENYON ONE BROADWAY NEW YORK, NY 10004			HENRY, MATTHEW ALLAN	
			ART UNIT	PAPER NUMBER
			2116	

DATE MAILED: 10/05/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/021,460

Applicant(s)

FURHRER ET AL.

Examiner

Matthew A. Henry

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 October 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6 and 8 is/are rejected.
- 7) ☒ Claim(s) 7 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 October 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: _____.

DETAILED ACTION

Drawings

1. The drawings are objected to because they are unclear. In regards to Figures 1-3, the handwriting is illegible and should be replaced with typed labels or numerical identifiers. Further concerning Figure 2, the "Selected Users" are transmitting G_i , not G as shown in the drawings.

The drawings are objected to under 37 CFR 1.83(a) because they fail to show the true chronological relationship between the users to be synchronized and the users selected to elicit this change as described in the specification. From the drawing, the difference between "Determining G " and "Calculating G " as done by the users to be synchronized is unclear. Further, G cannot be adequately determined if even a single G_i has not been transmitted. Therefore, the chronological relationship should place the "Determining G " time component of the users to be synchronized after the transmission stage is complete. Alternatively, the users to be synchronized can be depicted "Collecting G_i s." Any structural detail that is essential for a proper understanding of the disclosed invention should be shown in the drawing. MPEP § 608.02(d).

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate

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figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

2. The disclosure is objected to because of the following informalities:

The specification makes repeated reference to first, second and overall global times (See Page 3, Lines 4-6 and 9 for example). However, there can only be one true global time as the word global implies that it spans the entire entity. It is suggested that the first and second global times be referred to as first and second local times to demonstrate that these times are originating from a single component or incomplete portion within the global environment.

On Page 9, Line 8, the phrase "local view of the local time" appears, bringing in to further uncertainty what is meant by a first and second global time. To be consistent with the rest of the specification, this phrase should read "local view of the global time."

Appropriate correction is required.

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3. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

The following title is suggested: Method and System for the Distributed Synchronization of Users of a Communications Link

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1-5 and 8 are rejected under 35 U.S.C. 102(b) as being anticipated by Turski.

In regards to Claim 1, Turski teaches:

A method for synchronizing at least two users (Column 5, Lines 2-3), each of the users to be synchronized having a respective individual timer (Column 4, Lines 37-38), the users being connected by at least one communications link (Column 4, Lines 35-37), at least one event being transmitted for synchronization over the communications link (Column 5, Lines 51-52), the method comprising the steps of:

determining, by a first user, a first global time as a function of the at least one event (Column 5, Lines 63-66);

determining, by a second user, second global time as [a] function of the at least one event (Column 5, Lines 63-66);

transmitting, by the first user and the second user, the first global time and the second global time over the communications link (Column 6, Lines 14-17);

determining, by each of the first user and the second user, an overall global time using the first global time and the second global time (Column 7, Lines 18-26; in selecting a 'master node' the participating nodes in the system are determining an overall global time to with which all participating nodes will have a relationship); and

synchronizing, by each of the first user and the second user, the respective individual timer using the determined overall global time (Columns 8 and 9, Lines 23-25 and 2-8, respectively; nodes in this system will, after a synchronization request, transmit objects between each other with a time that is not a node's local time, but a time that can be acted upon appropriately by a different node, thereby demonstrating synchronization).

In regards to Claim 2, Turski teaches:

each of the first user and the second user determine the overall global time in the same manner (Column 5, Lines 18-23).

In regards to Claim 3, Turski teaches:

the at least one event is transmitted repeatedly over the communications link (Column 6, Lines 53-59; only in the case of uniform operation of the clocks in the many nodes of the system will a synchronization message need be transmitted only once. In all other case, the message will have to be repeated at least one additional time.).

In regards to Claim 4, Turski teaches:

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the synchronizing step further comprises:

approximating shapes of at least one of a first global time curve (Column 10, Line 18) and a second global time curve (Column 10, Line 20) between two events with the shape of an overall global time curve determined by at least one of the first user and the second user (Column 26, Lines 26-32 and 36-42), wherein the approximated shapes of the curves are used in synchronizing each respective individual timer (Column 10, Lines 11-13).

Regarding Claim 5, Turski teaches:

A method for synchronizing users (Column 5, Lines 2-3), each user to be synchronized having a respective individual timer (Column 4, Lines 37-38), the method comprising the steps of:

connecting a first number of users to be synchronized by a communications link (Column 4, Lines 35-37);

transmitting on the communications link at least one event for synchronization (Column 5, Lines 51-52);

determining, by each of the first number of users, a respective global time as a function of the at least one event (Column 5, Lines 63-66);

transmitting on the communications link by each of a second number of the users to be synchronized the respective global time, the second number being smaller than the first number (Column 7, Lines 10-14);

determining by the users to be synchronized, an overall global time using the transmitted respective global times (Column 7, Lines 14-15); and

synchronizing, by each of the users to be synchronized, the respective individual timer using the determined overall global time (Columns 8 and 9, Lines 23-25 and 2-8, respectively; nodes in this system will, after a synchronization request, transmit objects between each other with a time that is not a node's local time, but a time that can be acted upon appropriately by a different node, thereby demonstrating synchronization).

In regards to Claim 8, Turski teaches:

A system for synchronizing at least two users (Column 5, Lines 2-3), each user to be synchronized having a respective timer (Column 4, Lines 37-38), the at least two users being connected by at least one communications link (Column 4, Lines 35-37), an event for synchronization being transmitted on the communications link (Column 5, Lines 51-52), the system comprising:

- a first arrangement at the first user determining a first global time as function of the event (Column 5, Lines 63-66);

- a second arrangement at the second user determining a second global time as a function of the event (Column 5, Lines 63-66);

- a respective transmitter at each of the first user and the second user transmitting the first global time and the second global time (Column 6, Lines 14-17);

- a determination arrangement at each of the first user and the second user determining an overall global time from the first global time and the second global

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time (Column 7, Lines 18-26; in selecting a 'master node' the participating nodes in the system are determining an overall global time to with which all participating nodes will have a relationship); and

a synchronizer at each of the first user and the second user synchronizing the respective timer using the overall global time (Columns 8 and 9, Lines 23-25 and 2-8, respectively; nodes in this system will, after a synchronization request, transmit objects between each other with a time that is not a node's local time, but a time that can be acted upon appropriately by a different node, thereby demonstrating synchronization).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Turski in view of Halstead.

Turski teaches:

The method according to claim 5 (See above 102(b) rejection of Claim 5).

The device disclosed by Turski is designed in part to alleviate the heavy burden that may be cast upon on a communication bus when broadcasting information and further demonstrates that, as broadcasting can be limited, the load on a communication bus can be further reduced (Column 7, Lines 6-10).

Turski does not teach:

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determining a correction quantity from shapes of at least one of first global time curve and a second global time curve; and

approximating the shape of at least one of the first global time curve and the second global time curve using a shape of an overall global time curve and the correction quantity by fitting, at least one of a maximum value and a minimum value being predefined for the correction quantity.

Halstead teaches:

determining a correction quantity from shapes of at least one of first global time curve and a second global time curve (Column 3, Lines 56-57 and 62-63); and

approximating the shape of at least one of the first global time curve and the second global time curve using a shape of an overall global time curve and the correction quantity by fitting (Column 3, Lines 56-57 and 62-63), at least one of a maximum value and a minimum value being predefined for the correction quantity (Column 3, Lines 39-41; linear regression requires only two event pairs to provide a result, this minimum requirement ensures that one may be a maximum and the other a minimum).

Halstead teaches of determining the relationship between two sets of processors by comparing two send receive pairs plotted using each set's time as an axis on a graph. By linear regression, a best-fit line can be determined to define an accurate global time for the two sets of processors. This method can be easily used to define a correction quantity as the correction quantity would be the relationship of a set's local time to the resultant global time. Further, the

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shape of any set's local time curve can be easily determined using the overall global time curve thus determined as related to the correction quantity determined above.

Halstead's invention makes uses of a single postprocessor to determine the drift and offset parameters described above for the purposes, in part, to avoid "additional message communication" over a system bus (Column 1, Lines 46-47). While Halstead's invention is not a distributed system, it is important to understand his goal of reducing bus usage. Halstead's motivation for determining a global clock with consideration for drift and offset when synchronizing a plurality of processors is to "coordinate the activity of the various systems on the network" (Column 2, Lines 49-50). Halstead states, "Without a precise global time base, it is difficult to compare the timing of events on different processors" (Column 1, Lines 22-23). Without accounting for drift and offset, variations in timing between processors could show an increasing or decreasing trend over time (Column 3, Lines 20-24).

It would have been obvious to a person of ordinary skill in the art to combine the distributed synchronization method deemed obvious by Turski with the method for analyzing and compensating for drift and offset in a synchronized multiprocessor system as described by Halstead because they are similarly interested in reducing the load created by broadcasting information over a bus, thus arriving at the invention as claimed above.

Allowable Subject Matter

Claim 7 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Nakai teaches a partially distributed clock synchronization method wherein each node in the system uses the local times of the other nodes in the system in addition to its own local time to determine a global time. However, these nodes calculate the global time at different times, rather than concurrently.

Premarlani teaches of distributing phase and frequency information over a transmission line and therefrom synchronizing the local clocks to each other rather than a master clock.

Horst synchronizes processors by distributing counter information in a multiprocessor system to from each processor to all other processors in the system. Computing is halted in those processors that are ahead of others and lagging processors are allowed to catch up. Once all processors have reached the same counter value, computing is resumed or continued on all processors.

Rasmussen teaches of synchronizing a set of processors by having each processor capture the clocks of the other processors in the system as requested by a synchronization pulse. When completed by all processors in the system,

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they may synchronize by calculating the processor that was in the middle of the other processors. Therefrom, each processor may synchronize to this clock.

Eidson teaches of a distributed synchronization system wherein each node will send a message containing its clock information, however he speaks of the nodes converging in time, suggesting the process is not as instantaneous as the invention described above.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew A. Henry whose telephone number is (571) 272-3845. The examiner can normally be reached on Monday - Friday (8:00 am -5:00 pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lynne Browne can be reached on (571) 272-3670. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


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